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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,242	01/14/2005	Miki Ogawa	03500.017473.	7202

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EXAMINER	
EMPIE, NATHAN H	
ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
12/04/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/521,242	OGAWA, MIKI	
	Examiner	Art Unit	
	NATHAN H. EMPIE	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/29/09 has been entered. Claims 1, 3, 5, and 17 are currently pending examination, claims 2, 4, and 6-16 have been cancelled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stucky (WO 99/37705; hereafter Stucky) in view of Nogues et al (US patent 5,076,980; hereafter Nogues) and Miyata et al. ("Alignment of Mesoporous Silica on a Glass Substrate by a Rubbing Method" Chem. Mater. V11 (1999) 1609 – 1614; as provided in applicant's IDS dated 9/29/05; hereafter Miyata).

Claim 1, 3, 5, and 17: Stucky teaches a method for manufacturing a mesoscopically ordered, mesoporous structured films and monoliths (of metal oxides

such as SiO_2, SnO_2, etc) (abstract, pg 18 lines 20 – pg 19 line 30, pg 36 line 24 – pg 37 line7) comprising the steps of:

preparing a reactant solution that contains a metal precursor material for forming mesostructured films and monoliths which contain a metal oxide (see, for example, TEOS (pg 36 line24 – pg 37 line7), or metal chlorides (such as, $SnCl_4$, listed in pg 65,Table 3)) and amphiphilic materials such as a non-ionic surfactant (see, for example, $C_{16}H_{33}(OCH_2CH_2)_{10}OH$ ($C_{16}EO_{10}$) (cetyl hydrophobic group) and numerous other non-ionic alkyl polyethylene oxide (polyoxyethylene-ether) surfactants (pg 38 lines 21 –30, pgs 63-64, Table 2) or amphiphilic poly(alkylene oxide) block copolymers (see, for example, PEO-PPO-PEO pg 18 lines 20 – pg 19 line 30));

applying the reaction solution onto a substrate by a process such as spin-, drop-, or dip-casting (see, for example, (pg 36 line 24 – pg 37 line7), (pg 42 lines 8 – 23)).

Stucky teaches an aging time to allow the solution to gel, and drying of gel (see, for example, (pg 42 lines 8 – 23)). Stucky further teaches that in the processes of forming these mesoporous films and monoliths, synthetic conditions such as the humidity can be modified to impact the resulting structure of the film (pg 46 lines 5 – 13), thereby recognizing humidity as a result effective variable. Also Stucky mentions that modifications including additional heat treatments following gelation can produce harder materials that are less likely to crack, but Stucky is silent as to the specifics of such treatments (pg 39 lines 1 – 7), so Stucky does not explicitly teach forming the mesostructured film at a temperature of 100°C or less in a vapor-containing atmosphere at a relative humidity in a range of from 70% to 100%. Nogues teaches a two-part

drying step where the first-step of the process involves placing a gelled sol-gel (from a TEOS precursor) in an oven at a relatively low temperature (40-80°C), the heating further (from 40-100°C) at relative humidity preferably between about 80-100% (col 5 lines 33 – 39, col 6 lines 7 – 21). This hydrated heat treatment is conducted to reduce the amount of drying-induced cracking that occurs during the drying of sol-gel precursors (col 1 lines 44 – 64, col 2 lines 25 – 37). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated a preliminary heating-treatment step involving holding the sol gel in water vapor containing high humidity environment of between 80-100% RH, at 40-100°C as taught by Nogues, into the process of forming a sol-gel derived coating, as taught Stucky, as Stucky describes humidity as result effective variables for his process, as well as introducing additional heat treatments, but is silent as to specific conditions of each, and Nogues teaches the conditions of a high humidity treatment step that will lessen the occurrence of drying-induced cracking of a sol-gel.

Stucky in view of Nogues teaches all the features of these claims except for the limitations directed to the substrate having a capability of / and orienting an aggregate of the amphiphilic material in a predetermined direction. Stucky further teaches that the reaction solution can be applied onto a substrate (such as glass) by a process such as spin-, drop-, or dip-casting (see, for example, (pg 36 line 24 – pg 37 line7), (pg 42 lines 8 – 23)). Miyata teaches a method of preparing a film of mesoporous material (silica, from a TEOS / surfactant reactant solution) on a coated glass substrate (see, for example, pg 1609-1610, Abstract, and “Experimental Section”). The glass substrate is

provided with a polyimide film that is treated with rubbing which gives alignment control to the substrate, which is taught as desirable in that it provides an ordered mesoporous films with aligned channels (see, for example, pg 1610, first col, and "Experimental Section"). The result of the film formation process is an aligned structured with oriented channels aligned with respect to the substrate. It would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated using a glass substrate provided with a precoating of a rubbed polymer film, as taught by Miyata, as the glass substrate taught in the method of Stucky in view of Nogues as it would provide a desirable ordered alignment of the for the mesostructured / mesoporous coating. Such an incorporation would result in a method which would possess a substrate having a capability of orienting aggregate of the amphiphilic material, and one wherein aggregates of the amphiphilic material would be oriented in the predetermined (rubbing) direction.

Claim 17: Stucky further teaches removing the amphiphilic material to form a pore (see, for example, calcination step, pg 42 lines 19 - 23).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).
A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.
Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 3, 5 and 17 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of copending Application No. 11/267156 (hereafter '156) in view of Miyata.

Claims 1, 3, 5 and 17: '156 teaches a method of producing a mesostructured film comprising a reaction solution containing a precursor material (such as tin chloride) for a mesostructured film which contains a tin oxide, and an amphiphilic material (surfactant) (claims 1, 2, 4). '156 further teaches the step involving holding the substrate in a vapor containing atmosphere is performed at a temperature of 100^{o}C or less at a relative humidity in a range of from 70% to 100% (claims 1 and 3)

'156 teaches all the features of these claims except for the limitations directed to the substrate having a capability of / and orienting an aggregate of the surfactant material in a predetermined direction, and an actual recitation of removing the surfactant material to form a pore. These remaining limitations are taught by Miyata. Miyata teaches a method of preparing a film of mesoporous material (silica, from a TEOS / surfactant reactant solution) on a coated glass substrate (see, for example, pg 1609-1610, Abstract, and "Experimental Section"). The glass substrate is provided with a polyimide film that is treated with rubbing which gives alignment control to the substrate,

which is taught as desirable in that it provides an ordered mesoporous films with aligned channels (see, pg 1610, first col, and "Experimental Section"). The result of the film formation process is an aligned structured with oriented channels aligned with respect to the substrate. It would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated using a substrate provided with a precoating of a rubbed polymer film, as taught by Miyata, as the substrate in '156 as it would provide a desirable ordered alignment of the for the mesostructured / mesoporous coating. Although '156 has not explicitly taught removing the surfactant material to form a pore, it has taught forming a mesoporous material which is formed with an surfactant material (claim 1), and Miyata has further taught the removal of surfactant forms pores (see, for example, experimental section).

This is a provisional obviousness-type double patenting rejection.

As relied upon for above rejections, the examiner is putting Ogawa et al PGPub 2006/00057296 on record as it is the publication of application 11/267156.

Response to Arguments

Applicant's arguments filed 9/29/09 have been fully considered but they are not persuasive.

The applicant's argument that "one is led away from combining Stucky with Nogues" are unconvincing. The applicant has cited a number of citations from Stucky directed to the hydrolysis process and the influence of water upon such processes during mixing of precursors. The examiner asserts that by incorporation of Nogues, the examiner is not violating the teachings or methods of Stucky. The examiner asserts

that processing steps up to and including gelation, comprising hydrolysis / condensation through gelling are taught by Stucky. Stucky has further taught that "Heat treatment *after* gelation can also produce harder material that are less likely to crack" (pg 39, lines 1 -7). The incorporated teaching of Nogues is therefore directed to such processing steps *following* gelation. Both Stucky and Nogues are drawn to methods to produce stable sol gel structures, wherein Nogues has explicitly taught a way to reduce cracking via heat treatment in alignment with the broad teaching of Stucky. In this case, Stucky teaches an aging time to allow the solution to gel, and drying of gel (see, for example, (pg 42 lines 8 – 23)), but does not explicitly teach holding the gel in an atmosphere containing water vapor to form crystals of a metal oxide in pore walls of the mesoporous film by hydrolysis or condensation. Stucky does however teach that in the processes of forming these mesoporous films and monoliths, synthetic conditions such as the humidity can be modified to impact the resulting structure of the film (pg 46 lines 5 – 13), thereby recognizing humidity as a result effective variable. Also Stucky mentions that modifications including additional heat treatments following gelation can produce harder materials that are less likely to crack, but Stucky is silent as to the specifics of such treatments (pg 39 lines 1 – 7). Nogues teaches the conditions of a hydrated heat treatment which result in a reduction in the amount of drying-induced cracking that occurs during the drying of sol-gel precursors (col 1 lines 44 – 64, col 2 lines 25 – 37). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated a preliminary heating-treatment step involving holding the sol gel in a high humidity environment of between 80-100% RH, at 40-

100°C as taught by Nogues, into the process of forming a sol-gel derived coating, as taught Stucky, as Stucky describes humidity as a result effective variable for his process, as well as introducing additional heat treatments, but is silent as to specific conditions of each, and Nogues teaches the conditions of a high humidity treatment step that will lessen the occurrence of drying-induced cracking of a sol-gel. The teachings of Stucky have broadly and generally presented exemplary methods including combining precursors as non-aqueous solutions, but such teachings have not sufficiently attacked or taught away from exposing the gelled coating to a humid environment, but have alternately taught toward modifying humidity within the process to optimize the desired film (see, for example, Stucky, pg 46 lines 5-8). "the prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed…" In re Fulton, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

As to the dependent claims, they remain rejected as no separate arguments are provided.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN H. EMPIE whose telephone number is (571)270-1886. The examiner can normally be reached on M-F, 7:00- 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on (571) 272-1418. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. H. E./
Examiner, Art Unit 1792

/Katherine A. Bareford/
Primary Examiner, Art Unit 1792